

REMARKS

Applicants thank the Examiner for acknowledging the claim for priority under 35 U.S.C. § 119, and receipt of a certified copy of the priority document submitted February 18, 2004.

Applicants thank the Examiner for considering the references cited with the *Information Disclosure Statement* filed February 23, 2004.

Status of the Application

Claims 1-47 are all the claims pending in the Application, as claims 11-47 are hereby added. Claims 1-10 stand rejected.

Claims 3, 5, 6, 8 and 9 are editorially amended to improve the readability thereof. These amendments are non-limiting, are not for reasons of patentability, and are not believed to give rise to estoppel.

Drawings

The Examiner has objected to the Drawings. Specifically, the Examiner has objected to: (1) “paragraph 0065” for listing “FIGS. 6A and 68,” rather than “FIGS. 6A and 6B;” and (2) elements 63 and 64 shown in FIG. 12 that are not described in the specification.

Regarding (1), the specification of the instant Application was not filed with paragraph numbers. Thus, Applicants believe that the Examiner is objecting to the published version of the instant Application, US 2004-0130583-A1, in which paragraph 0065 does indeed contain the error cited by the Examiner. However, the specification of the instant Application does not contain this error (see lines 10-13 on page 14 of the specification as-filed). Thus, Applicants

respectfully submit that there is no need to amend the instant specification, as the typographical error is only in the published version of the instant Application, and is the fault of the USPTO.

Regarding (2), Applicants amend the instant Application to include descriptions of element numbers 63 and 64 shown in FIG. 12. It is not believed that this simple identification of clearly shown elements of the Application gives rise to new matter concerns.

In view of the above, Applicants respectfully request withdrawal of this objection.

Specification Objections

The Examiner has objected to the Abstract for containing the word “comprising.” The Abstract is hereby amended to replace “comprising” with “including.” Thus, withdrawal of this objection is respectfully requested.

The Examiner has also objected to the Title for its brevity. Applicants hereby amend the Title according to the Examiner’s helpful suggestion. Thus, withdrawal of this objection is respectfully requested.

Obviousness Rejection

The Examiner has rejected, under 35 U.S.C. § 103(a): (1) claims 1, 4, 7, 8 and 10 as being unpatentable over *Yamaguchi et al.* (US 6,270,210; hereinafter “*Yamaguchi*”) in view of *Young et al.* (US 2003/0015036 A1; hereinafter “*Young*”); and (2) claims 2, 3, 5, 6 and 9 as being unpatentable over *Yamaguchi* in view of *Young* in further view of *Usui et al.* (US 6,536,861; hereinafter “*Usui*”). These rejections are respectfully traversed.

Independent Claim 1

The Examiner takes the position that many of the features of independent claim 1 are disclosed by *Yamaguchi*, specifically alleging that: (1) ink cartridge 1; (2) conduit 14; (3) ink bag

10; and (4) ink depletion detecting plate 20 are similar to the recited: (1) “liquid container;” (2) “liquid supply port;” (3) “flexible member;” and (4) “rigid member” recited in those claims (*O.A.*, p. 4).

However, the Examiner concedes that *Yamaguchi* fails to teach or suggest claim 1’s recitation of a “vibration activating and detecting unit,” that such a unit is arranged opposing the rigid member, or that “an amount of remaining liquid is detected based on a vibration characteristic of said vibration activating and detecting unit which depends on a distance between said vibration activating and detecting unit and said rigid member” (*O.A.*, p. 5).

Applicants agree that *Yamaguchi* is deficient with respect to *at least* these features of independent claim 1.

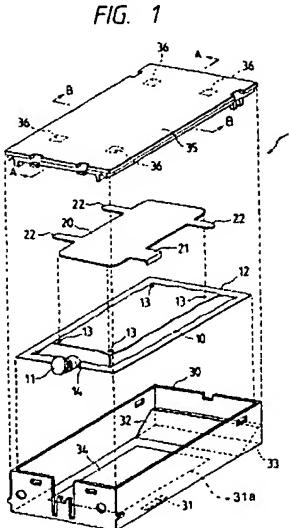
Nevertheless, the Examiner alleges that *Young* discloses the features missing from *Yamaguchi*, specifically alleging that resonating means 24 is similar to the recited “vibration activating and detecting unit,” and works in the same way, citing par. 0023 (*O.A.*, pp. 5-6). Further, the Examiner alleges that one of ordinary skill in the art at the time of the invention (“one of skill”) would have been motivated to modify *Yamaguchi* to include the resonating means 24 of *Young* “for the purpose of providing an accurate measurement of liquid level within a liquid container, responding to the vibration signals provided from the tank/container/wall; measuring the liquid in the container and for the purpose of providing an accurate measurement of liquid level within a liquid container” (*O.A.*, p. 7).

Applicants respectfully disagree with the allegation that: (1) one of skill would have been motivated to modify *Yamaguchi* in view of *Young* (at least as the Examiner proffers); and (2) any

resultant combination of *Yamaguchi* and *Young* would teach or suggest all the features of independent claim 1.

First, Applicants respectfully submit that one of skill would not have been motivated to modify *Yamaguchi* in view of *Young* to include both ink depletion detecting plate 20 (alleged by the Examiner to correspond to the recited “rigid member”) and an acoustic volume indicator 10 with resonating means 24 (alleged by the Examiner to correspond to the recited “vibration activating and detecting unit”).

Specifically, depletion detecting plate 20 of *Yamaguchi* is arranged on ink bag 10 to “follow[] any deformation of the ink bag 10 caused by a change in the amount of ink in the ink bag 10” (col. 4, lines 50-52), and provides thereon detecting piece 21, which serves to notify an operator of a low-ink condition by extending out of window 31 when the ink bag 10 is drained.

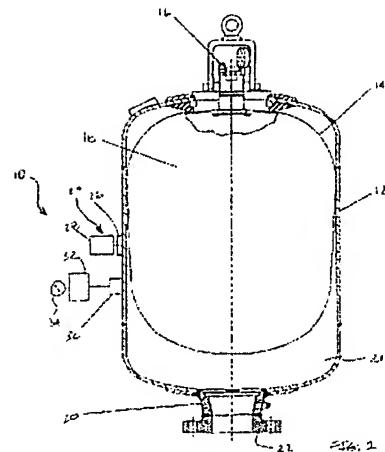


In contrast, *Young* is directed to an acoustic volume indicator provided on a pressurized tank 12. This tank contains air within bladder 14, and liquid within tank internal chamber 21 (par. 0017-0018). Thus, it is of a configuration exactly opposite of *Yamaguchi*.

In other words, since *Young* discloses that liquid is contained in the chamber of tank 12 outside of bladder 14, and since *Yamaguchi* discloses an ink bar 10 in which ink is contained, the part where liquid is contained is different between *Young* and *Yamaguchi*. Similarly, *Young* fails to teach or suggest any particular liquid ejection through valve 16, and thus valve 16 is quite different from *Yamaguchi*'s ink supply port 11 (or, for that matter, the claimed "liquid supply port").

Further, *Young* discloses that while invasive-type indicators (*i.e.*, indicators that reside inside a tank itself - such as detecting plate 20 / detecting piece 21 of *Yamaguchi*) are known, they are inapplicable to be used in pressurized tanks, such as pressurized tank 12 of *Young* (par. 0004-0005). Rather, *Young* discloses the use of an acoustic volume indicator 10 placed on the outer wall of tank 12 - where the acoustic volume indicator 10 causes the tank 12 to resonate, detects the resulting resonance signal from the tank 12, and then determines a corresponding liquid level in the tank 12 (as the liquid volume in a tank increases, the natural frequency of the tank decreases, and *vice versa*).

Accordingly, one of skill would not utilize both the ink depletion detecting plate 20 of *Yamaguchi* and acoustic volume indicator 10 of *Young* in a measurement system because: (1) they are alternative, rather than complementary, methods to accomplish the same general



function of volume measurement; (2) *Young* specifically indicates that an invasive-type indicator, such as plate 20, would not be used in conjunction with a pressurized container using acoustic volume indicator 10; and (3) there is no teaching or suggestion of how *Young*'s acoustic volume indicator 10 could determine a volume level of ink bag 10 (rather than the volume of ink in an outer chamber), which is the entire point of *Yamaguchi*.

Second, even if it were possible to modify *Yamaguchi* in view of *Young* as the Examiner has alleged, Applicants respectfully submit that neither *Yamaguchi* nor *Young* (nor any combination thereof) teaches or suggests independent claim 1's recitation that "an amount of remaining liquid is detected based on a vibration characteristic of said vibration activating and detecting unit which depends on a distance between said vibration activating and detecting unit and said rigid member."

Rather, as discussed above, *Young*'s acoustic volume indicator 10: (1) causes the tank 12 to resonate; (2) detects the resulting resonance signal from the tank 12; and (3) determines a corresponding liquid level in the tank 12 due to the changing natural frequency of the tank. Accordingly, the amount of remaining liquid is determined in *Young* in a manner independent of the distance between resonating means 24 (compared by the Examiner to the "vibration activating and detecting unit") and any "rigid member." In fact, there is no teaching or suggestion of any relative movement of these parts in *Young*.

Thus, Applicants respectfully submit that independent claims 1 and 10 are patentable over the applied references. Further, Applicants respectfully submit that rejected dependent claims 2-9 are allowable, at least by virtue of their dependency.

Independent Claim 10

The Examiner takes the position that all of the features of independent claim 10 are disclosed by a combination of *Yamaguchi* and *Young*, similarly to independent claim 1 above. Applicants respectfully disagree, and submit that: (1) one of skill would not have been motivated to modify *Yamaguchi* in view of *Young* (at least as the Examiner proffers) for at least some of the reasons discussed above with respect to independent claim 1; and (2) even the proffered combination of *Yamaguchi* and *Young* would fail to teach or suggest all the features of independent claim 10.

Specifically, even if it were possible to modify *Yamaguchi* in view of *Young* as the Examiner has alleged, Applicants respectfully submit that neither *Yamaguchi* nor *Young* (nor any combination thereof) teaches or suggests independent claim 10's recitation of a liquid container comprising:

- a vibration activating unit provided on a first surface of said liquid container, for emitting a vibration to said liquid; and
- a vibration detecting unit provided on a second surface of said liquid container so as to be opposed to said vibration activating unit;

Rather, although the Examiner alleges that: (1) the "vibration activating unit" is similar to resonating means 24 of *Young*; (2) the "vibration detecting unit" is similar to sensing means 30 of *Young*; and (3) that resonating means 24 and sensing means 30 are "opposed" to each other, Applicants respectfully submit that resonating means 24 and sensing means 30 are not "opposed" to each other. Rather, they are arranged next to each other (see FIG. 1 included above in the discussion of independent claim 1).

Thus, Applicants respectfully submit that independent claim 10 is patentable over the applied references.

Thus, Applicants respectfully request that the Examiner withdraw this rejection.

New Claims

Claims 11-47 are hereby added.

Dependent claims 11, 13, 14 and 47 are dependent from independent claim 1, are fully supported *at least* by FIGS. 5A/5B, 10A, 9B and 1 (respectively) of the instant Application, and are respectfully submitted to be allowable both by virtue of their dependency, and by virtue of the features recited therein.

Dependent claim 12 is dependent from independent claim 10, is fully supported *at least* by FIGS. 5A/5B of the instant Application, and is respectfully submitted to be allowable both by virtue of its dependency, and by virtue of the features recited therein.

Independent claim 15 is similar to independent claim 1, but recites the arrangement of the flexible member and, for example, the vibration activating and detecting unit, in different language. This recitation is fully supported at least by FIG. 1 of the instant Application. Independent claim 15 is respectfully submitted to be allowable by virtue of the features recited therein.

Claims 16-23, 27, 29 and 30 are: (1) dependent from independent claim 15; (2) similar to claims 1-9, 11, 13 and 14; (3) fully supported in a fashion similar to claims 1-9, 11, 13 and 14; and (4) respectfully submitted to be allowable by virtue of the features recited therein, and by virtue of their dependency.

Dependent claim 25 is: (1) dependent from independent claim 15; (2) fully supported *at least* by pages 13 and 14 of the specification; and (3) respectfully submitted to be allowable by virtue of the features recited therein, and by virtue of its dependency.

Independent claim 24 is similar to independent claim 10, but recites the arrangement of the flexible member and, for example, the vibration activating unit, in different language. This recitation is fully supported at least by FIG. 1 of the instant Application. Independent claim 24 is respectfully submitted to be allowable by virtue of the features recited therein.

Claim 28 is: (1) dependent from independent claim 24; (2) similar to claim 12; (3) fully supported in a fashion similar to claim 12; and (4) respectfully submitted to be allowable by virtue of the features recited therein, and by virtue of its dependency.

Claim 26 is: (1) dependent from independent claim 24; (2) fully supported *at least* by pages 13 and 14 of the specification; (3) respectfully submitted to be allowable by virtue of the features recited therein, and by virtue of its dependency.

Independent claim 31 is similar to independent claim 15, but recites that the liquid container comprises a hard outer case and an ink bag, and that the flexible member is part of that ink bag. This recitation is fully supported at least by FIG. 1 of the instant Application. Independent claim 31 is respectfully submitted to be allowable by virtue of the features recited therein.

Claims 32-39, 41, 43, 45 and 46 are: (1) dependent from independent claim 31; (2) similar to claims 16-23, 25, 27, 29 and 30; (3) fully supported in a fashion similar to claims 16-23, 25, 27, 29 and 30; and (4) respectfully submitted to be allowable by virtue of the features recited therein, and by virtue of their dependency.

Independent claim 40 is similar to independent claim 24, but also recites that the liquid container comprises a hard outer case and an ink bag, and that the flexible member is part of that ink bag. This recitation, as noted above, is fully supported at least by FIG. 1 of the instant

Amendment Under 37 C.F.R. § 1.111
U.S. Appln No. 10/669,638

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Application. Independent claim 40 is respectfully submitted to be allowable by virtue of the features recited therein.

Claims 42 and 44 are: (1) dependent from independent claim 40; (2) similar to claims 26 and 28; (3) fully supported in a fashion similar to claims 26 and 28; and (4) respectfully submitted to be allowable by virtue of the features recited therein, and by virtue of their dependency.

Conclusion

In view of the foregoing, it is respectfully submitted that claims 1-47 are allowable. Thus, it is respectfully submitted that the application now is in condition for allowance with all of the claims 1-47.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Please charge any fees which may be required to maintain the pendency of this application, except for the Issue Fee, to our Deposit Account No. 19-4880.

Respectfully submitted,



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